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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,041	06/23/2003	Yasuhiro Chono	199372005100	9511

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EXAMINER

LUND, JEFFRIE ROBERT

ART UNIT	PAPER NUMBER
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1763

DATE MAILED: 02/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/602,041

Applicant(s)

CHONO ET AL.

Examiner

Jeffrie R. Lund

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2005.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 and 24-26 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☐ Claim(s) _____ is/are allowed.
6) ☒ Claim(s) 1-10 and 24-26 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☒ The drawing(s) filed on 23 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4, 9, 10, and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al, US Patent 5,281,295, in view of Frankel et al, US Patent 6,019,848.

Maeda et al teaches an ozone processing apparatus that includes: an ozone generator 10 for generating ozone from an oxygen containing gas; a plurality of processing chamber 27a-27e for processing a substrate with the ozone containing gas; a plurality of ozone-containing gas supply lines 19a-19e connecting the ozone generator and the processing chamber; a flow regulator 16a adapted to regulate the flow rate of the oxygen-containing gas supplied to the ozone generator; a plurality of variable throttles 24a-24e; a plurality of flow measuring devices 25a-25e; and a plurality of processing fluid discharge lines. (Figures 1, 2a, 2b)

Maeda et al differs from the present invention in that Maeda et al does not teach a controller that determines the ozone-containing gas demand and controls the flow regulator to supply the required amount of ozone-containing gas to the chambers, a second ozone generator, flow control devices in the processing fluid discharge line, or using nitrogen gas controlled with a flow regulating device as a supplemental gas.

Frankel et al teaches a controller 50 that controls all aspects of the process including the determining the demand for the ozone-containing gas (from memory of specific process and monitoring the flow controllers) and controlling the gas source to provide the desired amount of precursor i.e. ozone by controlling the oxygen-containing gas flow and power supplied to the ozone generator to supply the desired amount of ozone containing-gas (Figures 1A, 1C, 1D, and column 15 line 28 through column 24 line 9, specifically, column 18 line 40 through column 19 column 25); a flow control device 63 for controlling the flow rate of the discharged processing fluid; and using nitrogen gas controlled with a flow regulating device 100 as a supplemental gas.

The motivation for adding the controller of Frankel et al to the apparatus of Maeda et al is to provide a means for controlling the apparatus to ensure the proper amounts of processing gases (including ozone) are produced for use in the processing chambers, and to automate the system. The motivation for adding discharge flow control device of Frankel et al to the discharge pipes of Maeda et al is to control the flow of the discharged gases, as required but not disclosed by Maeda et al. The motivation for using nitrogen as a supplemental gas is to dilute the oxygen to a desired concentration.

The motivation for duplicating the ozone generator of Maeda et al is to increase the amount of the ozone-containing gas that can be produced per unit of time to meet the required process requirements. Furthermore, it has been held that the duplication of parts is obvious (see *In re Harza* 124 USPQ 378).

Therefore it would have been obvious to one of ordinary skill in the art at the time

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the invention was made to add the controller and discharge flow control device to the apparatus of Maeda et al, use nitrogen as a carrier gas, and duplicate the ozone generator of Maeda et al.

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al and Frankel et al as applied to claims 1-4, 9, 10 and 24-26 above, and further in view of Harada et al, US Patent 5,632,868.

Maeda et al and Frankel et al differ from the present invention in that they do not teach using carbon dioxide gas controlled with a flow regulating device as a supplemental gas.

Harada et al teaches using carbon dioxide 2 controlled with a flow regulating device 6 as a supplemental gas and mixed with oxygen to form ozone, and a controller that regulates the power supplied to the ozone generator.

The motivation for using carbon dioxide controlled with a flow regulating device as a supplemental gas, in the apparatus as Maeda et al and Frankel et al, is to control the formation of NO_x, and to provide an alternate supplemental gas as taught by Harada et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use carbon dioxide controlled with a flow regulating device as a supplemental gas in the apparatus of Maeda et al and Frankel et al as taught by Harada et al.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al, Frankel et al, and Harada et al as applied to claims 1-5, 9, 10, and 24-26 above, and

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further in view of Harvey et al, US Patent 5,904,170.

Maeda et al, Frankel et al, and Harada et al differ from the present invention in that they do not teach an ozone concentration measuring device that measures the ozone concentration.

Harvey et al teaches an ozone concentration measuring device 60 that measures the ozone concentration and feeds the concentration to controller that controls the ozone generator. (Figure 4, column 3 line 39 through column 4 line 2)

The motivation for adding an ozone concentration measuring device to the apparatus of Maeda et al, Frankel et al, and Harada et al is to measure the ozone concentration and actively control the concentration through a control feed back loop as taught by Harvey et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the ozone concentration measuring device of Harvey et al to the apparatus of Maeda et al, Frankel et al, and Harada et al.

5. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maeda et al, and Frankel et al as applied to claims 1-4, 9, 10, and 24-26 above, and further in view of Toshima et al, US Patent 6,869,499 B1.

Maeda et al, and Frankel et al differ from the present invention in that they do not teach a steam source.

Toshima et al teaches an ozone and steam processing system that supplies ozone and steam to a processing chamber. (Entire document)

The motivation for adding the steam source to the apparatus of Maeda et al and

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Frankel et al is to enable the apparatus of Maeda et al and Frankel et al to process the substrates using steam as taught by Toshima et al.

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to add the steam source of Toshima et al to the apparatus of Maeda et al and Frankel et al.

Response to Arguments

6. Applicant's arguments, see pages 7-10, filed November 30, 2005, with respect to the 102 and double patenting rejections have been fully considered and are persuasive. The 102 and double patenting rejections have been withdrawn.

7. Applicant's argument directed to Maeda et al and Frankel et al filed November 30, 2005 have been fully considered but they are not persuasive. Applicant argues that Maeda et al does not teach a controller, and Frankel does not teach an oxygen-containing gas flow regulator. One cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). The rejection is based on the combination of Maeda et al which teaches a gas supply system including an oxygen-containing gas flow regulator 16a and Frankel et al teaches a controller that controls a gas source to ensure the necessary delivery gas flow rate of the source gas by controlling the flow of gases into the precursor generator i.e. O₂ into an ozone generator (column 19 lines 17-22). Thus the combination teaches the claimed invention.

In regard to the argument that Frankel et al teaches, "that multiple ozone

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generators may be provided for multiple ozone sources. Thus, Frankel suggests adding additional ozone generators to handle an increase in demand, rather than increase the generation of ozone produced/by a single generator." The Examiner notes that the applicant claims adding additional ozone generators to meet increased demand in claim 9.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

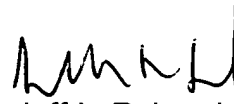
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrie R. Lund whose telephone number is (571) 272-1437. The examiner can normally be reached on Monday-Thursday (6:30 am-6:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-

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273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jeffrie R. Lund
Primary Examiner
Art Unit 1763

JRL
2/20/06